Williams®

16P-3002-103
December, 1981

STARGATE

DRAWING SET



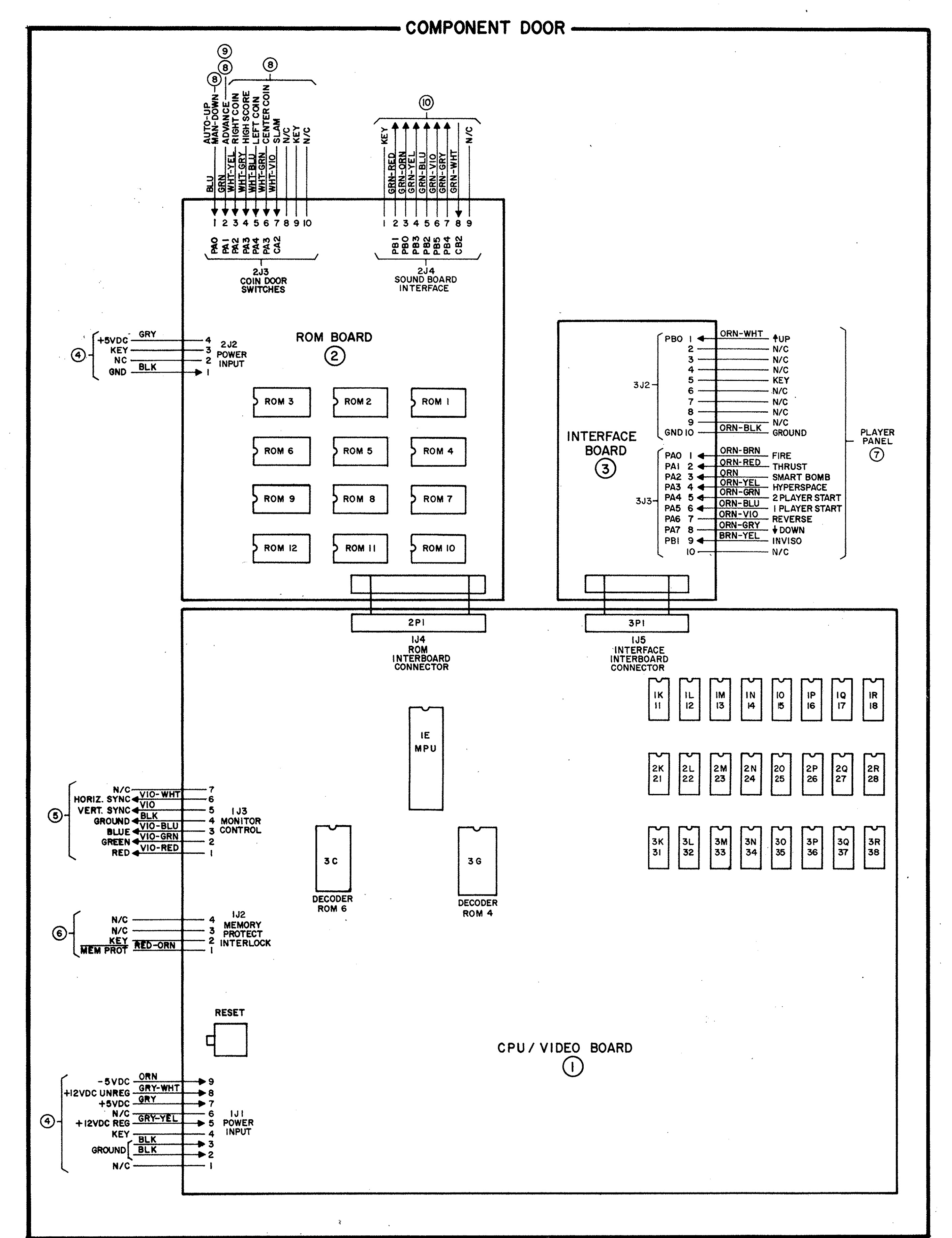
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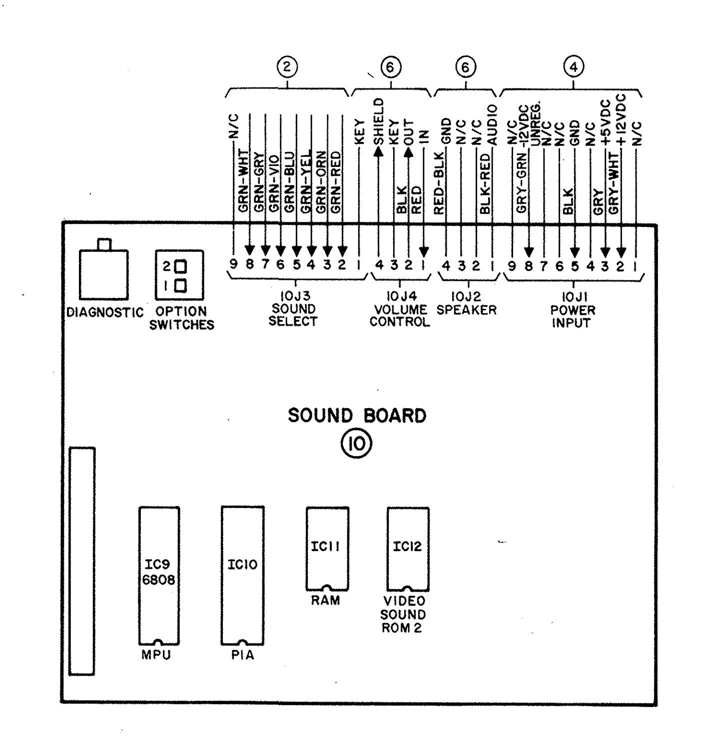
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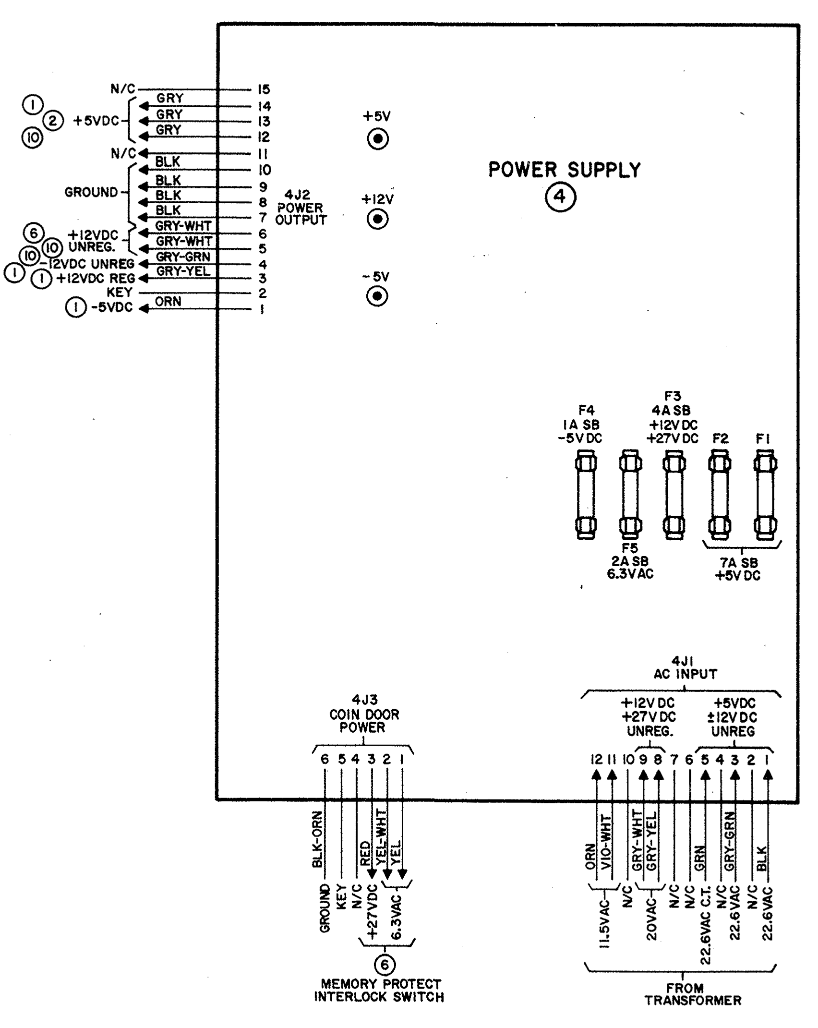
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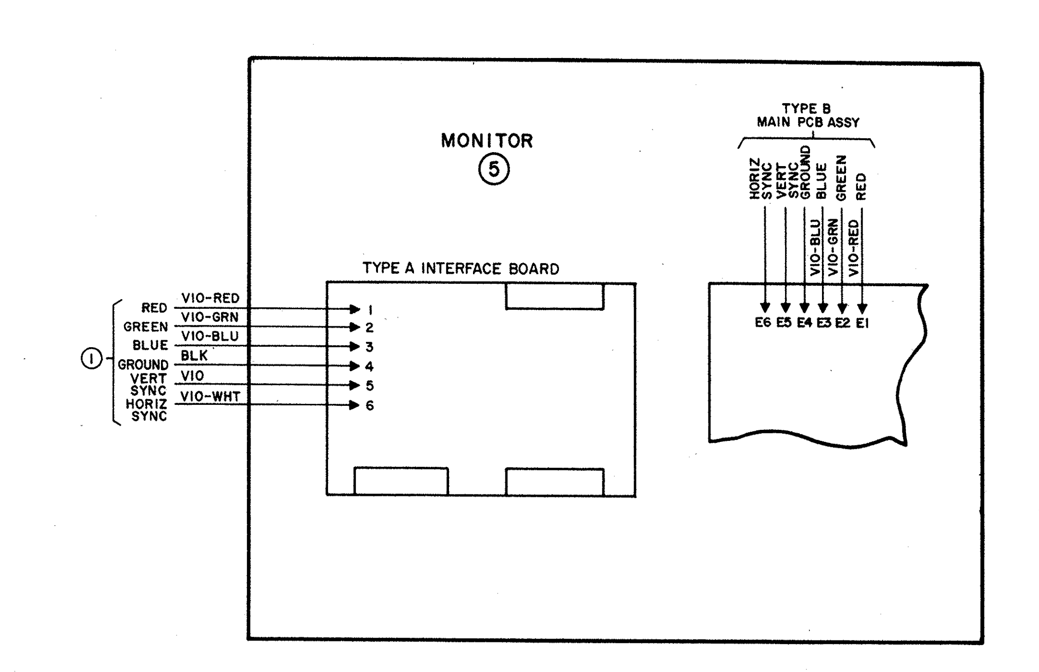
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(312) 267-2240

CONTENTS





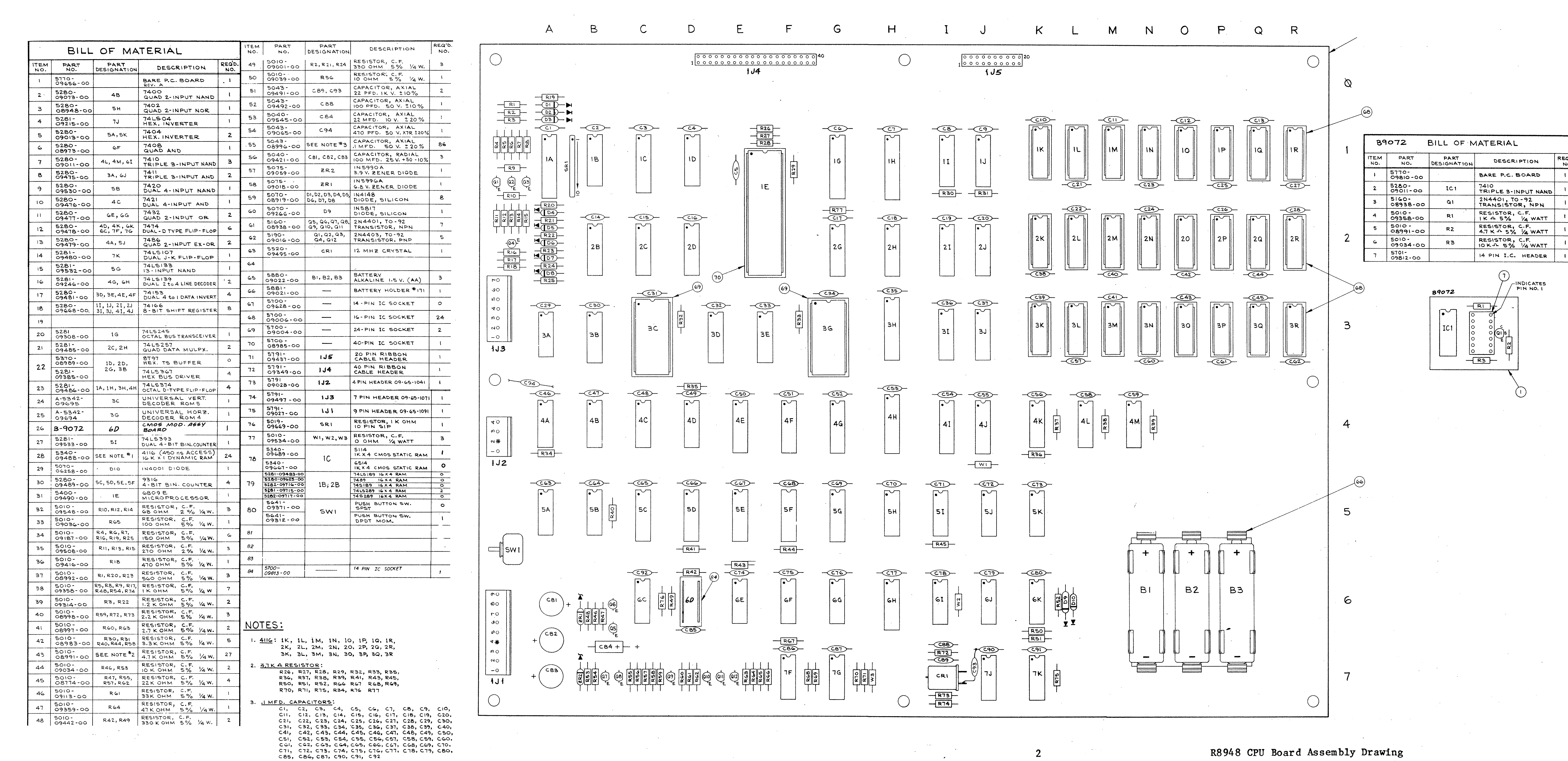




SIDE PANEL

1. CPU/VIDEO BOARD
2. ROM BOARD
3. INTERFACE BOARD
4. POWER SUPPLY
5. MONITOR
6. CABINET
7. PLAYER PANEL
8. COIN DOOR
9. CASH BOX
10. SOUND BOARD

Interboard Wiring Diagram



BILL OF MATERIAL

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
1	5770-09656-00		BARE P.C. BOARD REV. A	1
2	5280-09073-00	4B	7400 QUAD 2-INPUT NAND	1
3	5280-08948-00	5H	7402 QUAD 2-INPUT NOR	1
4	5281-09215-00	7J	74LS04 HEX. INVERTER	1
5	5280-09013-00	5A, 5K	7404 HEX. INVERTER	2
6	5280-08973-00	6F	7408 QUAD AND	1
7	5280-09011-00	4L, 4M, 6I	7410 TRIPLE 3-INPUT NAND	3
8	5280-09475-00	3A, 6J	7411 TRIPLE 3-INPUT AND	2
9	5280-09530-00	5B	7420 DUAL 4-INPUT NAND	1
10	5280-09476-00	4C	7421 DUAL 4-INPUT AND	1
11	5280-09477-00	6E, 6G	7432 QUAD 2-INPUT OR	2
12	5280-09478-00	4D, 4K, 6K 6C, 7F, 7G	7474 DUAL-D TYPE FLIP-FLOP	6
13	5280-09479-00	4A, 5J	7486 QUAD 2-INPUT EX-OR	2
14	5281-09480-00	7K	74LS107 DUAL J-K FLIP-FLOP	1
15	5281-09532-00	5G	74LS133 13-INPUT NAND	1
16	5281-09246-00	4G, 6H	74LS139 DUAL 2 to 4 LINE DECODER	2
17	5280-09481-00	3D, 3E, 4E, 4F	74153 DUAL 4 to 1 DATA INVERT	4
18	5280-09668-00	1I, 1J, 2I, 2J 3I, 3J, 4I, 4J	74166 8-BIT SHIFT REGISTER	8
19				
20	5281 09308-00	1G	74LS245 OCTAL BUS TRANSCEIVER	1
21	5281-09485-00	2C, 2H	74LS257 QUAD DATA MULPX.	2
22	5370-08989-00	1D, 2D, 2G, 3B	8T97 HEX. TS BUFFER	0
	5281-09385-00		74LS367 HEX BUS DRIVER	4
23	5281-09486-00	1A, 1H, 3H, 4H	74LS374 OCTAL D-TYPE FLIP-FLOP	4
24	A-5342-09695	3C	UNIVERSAL VERT. DECODER ROM 5	1
25	A-5342-09694	3G	UNIVERSAL HORZ. DECODER ROM 4	1
26	B-9072	6D	CMOS MOD. ASSY BOARD	1
27	5281-09533-00	5I	74LS393 DUAL 4-BIT BIN. COUNTER	1
28	5340-09488-00	SEE NOTE #1	4116 (450 ns ACCESS) 16 K x 1 DYNAMIC RAM	24
29	5070-06258-00	D10	IN4001 DIODE	1
30	5280-09489-00	5C, 5D, 5E, 5F	9316 4-BIT BIN. COUNTER	4
31	5400-09490-00	1E	6809 E MICROPROCESSOR	1
32	5010-09548-00	R10, R12, R14	RESISTOR, C.F. 68 OHM 2% ¼ W.	3
33	5010-09036-00	R65	RESISTOR, C.F. 100 OHM 5% ¼ W.	1
34	5010-09187-00	R4, R6, R7, R16, R19, R25	RESISTOR, C.F. 150 OHM 5% ¼ W.	6
35	5010-09508-00	R11, R13, R15	RESISTOR, C.F. 270 OHM 2% ¼ W.	3
36	5010-09416-00	R18	RESISTOR, C.F. 470 OHM 5% ¼ W.	1
37	5010-08992-00	R1, R20, R23	RESISTOR, C.F. 560 OHM 5% ¼ W.	3
38	5010-09358-00	R5, R8, R9, R17, R48, R54, R74	RESISTOR, C.F. 1 K OHM 5% ¼ W	7
39	5010-09314-00	R3, R22	RESISTOR, C.F. 1.2 K OHM 5% ¼ W.	2
40	5010-08998-00	R59, R72, R73	RESISTOR, C.F. 2.2 K OHM 5% ¼ W.	3
41	5010-08997-00	R60, R63	RESISTOR, C.F. 2.7 K OHM 5% ¼ W.	2
42	5010-08983-00	R30, R31 R40, R44, R58	RESISTOR, C.F. 3.3 K OHM 5% ¼ W.	5
43	5010-08991-00	SEE NOTE #2	RESISTOR, C.F. 4.7 K OHM 5% ¼ W.	27
44	5010-09034-00	R46, R53	RESISTOR, C.F. 10 K OHM 5% ¼ W.	2
45	5010-08774-00	R47, R55, R57, R62	RESISTOR, C.F. 22 K OHM 5% ¼ W.	4
46	5010-09113-00	R61	RESISTOR, C.F. 33K OHM 5% ¼ W.	1
47	5010-09359-00	R64	RESISTOR, C.F. 47 K OHM 5% ¼ W.	1
48	5010-09442-00	R42, R49	RESISTOR, C.F. 330 K OHM 5% ¼ W.	2

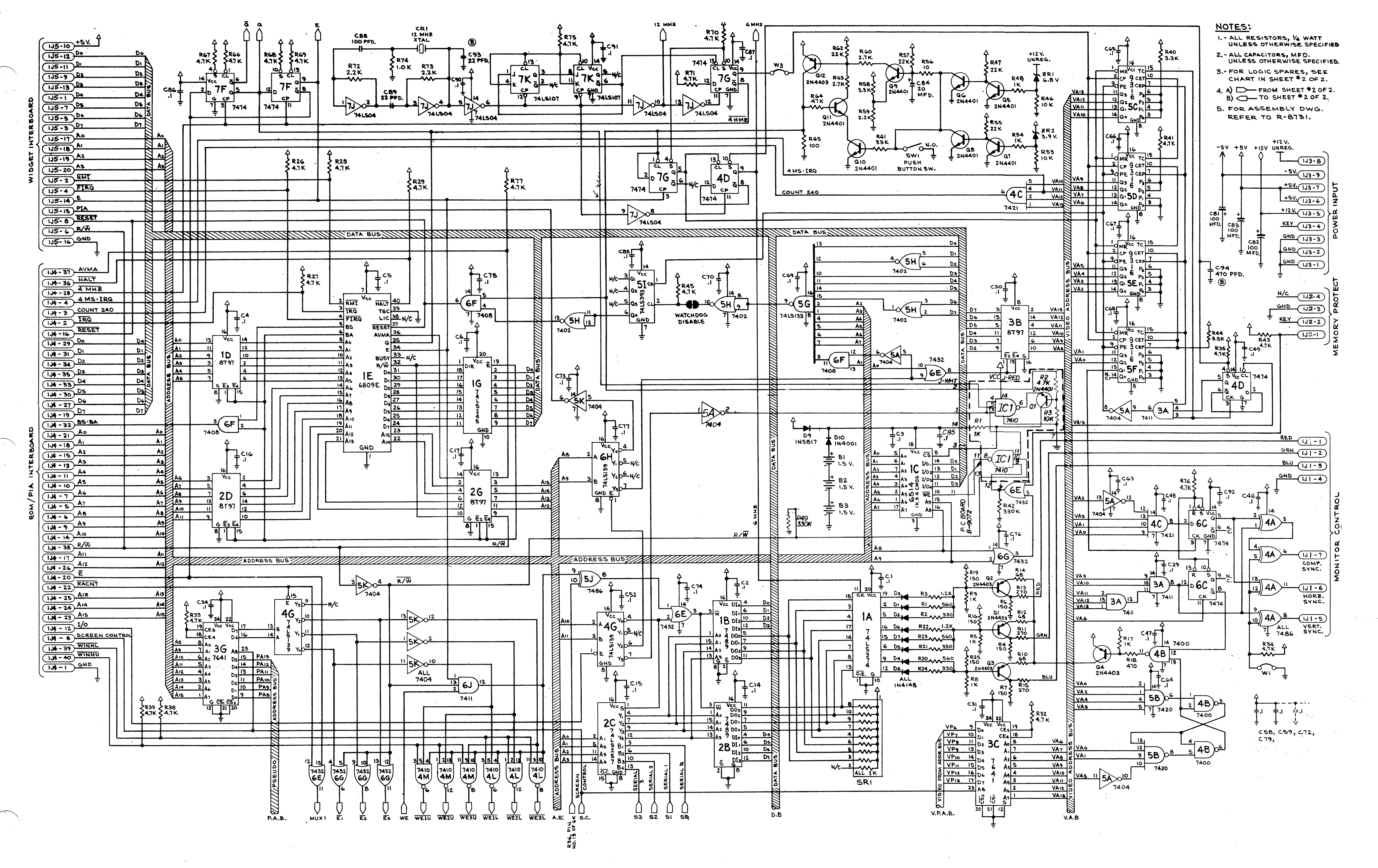
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
49	5010-09001-00	R2, R21, R24	RESISTOR, C.F. 330 OHM 5% ¼ W.	3
50	5010-09039-00	R56	RESISTOR, C.F. 10 OHM 5% ¼ W.	1
51	5043-09491-00	C89, C93	CAPACITOR, AXIAL 22 PFD. 1K V. ±10%	2
52	5043-09492-00	C88	CAPACITOR, AXIAL 100 PFD. 50 V. ±10%	1
53	5040-09545-00	C84	CAPACITOR, AXIAL 22 MFD. 10 V. ±20%	1
54	5043-09065-00	C94	CAPACITOR, AXIAL 470 PFD. 50 V. X7R ±20%	1
55	5043-08996-00	SEE NOTE #3	CAPACITOR, AXIAL .1 MFD. 50 V. ±20%	86
56	5040-09421-00	C81, C82, C83	CAPACITOR, RADIAL 100 MFD. 25 V. +50 -10%	3
57	5075-09059-00	ZR2	IN5990A 3.9 V. ZENER DIODE	1
58	5075-09018-00	ZR1	IN5996A 6.8 V. ZENER DIODE	1
59	5070-08919-00	D1, D2, D3, D4, D5, D6, D7, D8	IN4148 DIODE, SILICON	8
60	5070-09266-00	D9	IN5817 DIODE, SILICON	1
61	5160-08938-00	Q5, Q6, Q7, Q8, Q9, Q10, Q11	2N4401, TO-92 TRANSISTOR, NPN	7
62	5190-09016-00	Q1, Q2, Q3, Q4, Q12	2N4403, TO-92 TRANSISTOR, PNP	5
63	5520-09495-00	CR1	12 MHZ CRYSTAL	1
64				
65	5880-09022-00	B1, B2, B3	BATTERY ALKALINE 1.5 V. (AA)	3
66	5881-09021-00	—	BATTERY HOLDER #171	1
67	5700-09628-00	—	14-PIN IC SOCKET	0
68	5700-09006-00	—	16-PIN IC SOCKET	24
69	5700-09004-00	—	24-PIN IC SOCKET	2
70	5700-08985-00	—	40-PIN IC SOCKET	1
71	5791-09437-00	1J5	20 PIN RIBBON CABLE HEADER	1
72	5791-09349-00	1J4	40 PIN RIBBON CABLE HEADER	1
73	5791 09028-00	1J2	4 PIN HEADER 09-65-1041	1
74	5791-09497-00	1J3	7 PIN HEADER 09-65-1071	1
75	5791-09027-00	1J1	9 PIN HEADER 09-65-1091	1
76	5019-09669-00	SR1	RESISTOR, 1 K OHM 10 PIN SIP	1
77	5010-09534-00	W1, W2, W3	RESISTOR, C.F. 0 OHM ¼ WATT	3
78	5340-09689-00	1C	5114 1K X 4 CMOS STATIC RAM	1
	5340-09667-00		6514 1K X 4 CMOS STATIC RAM	0
79	5281-09483-00	1B; 2B	74LS189 16 X 4 RAM	0
	5280-09625-00		7489 16 X 4 RAM	0
	5282-09716-00		74S189 16 X 4 RAM	0
	5281-09715-00		74LS289 16 X 4 RAM	2
	5282-09717-00		74S289 16 X 4 RAM	0
80	5641-09371-00	SW1	PUSH BUTTON SW. SPST	0
	5641-09312-00		PUSH BUTTON SW. DPDT MOM.	1
81				
82				
83				
84	5700-09813-00	—	14 PIN IC SOCKET	1

NOTES:

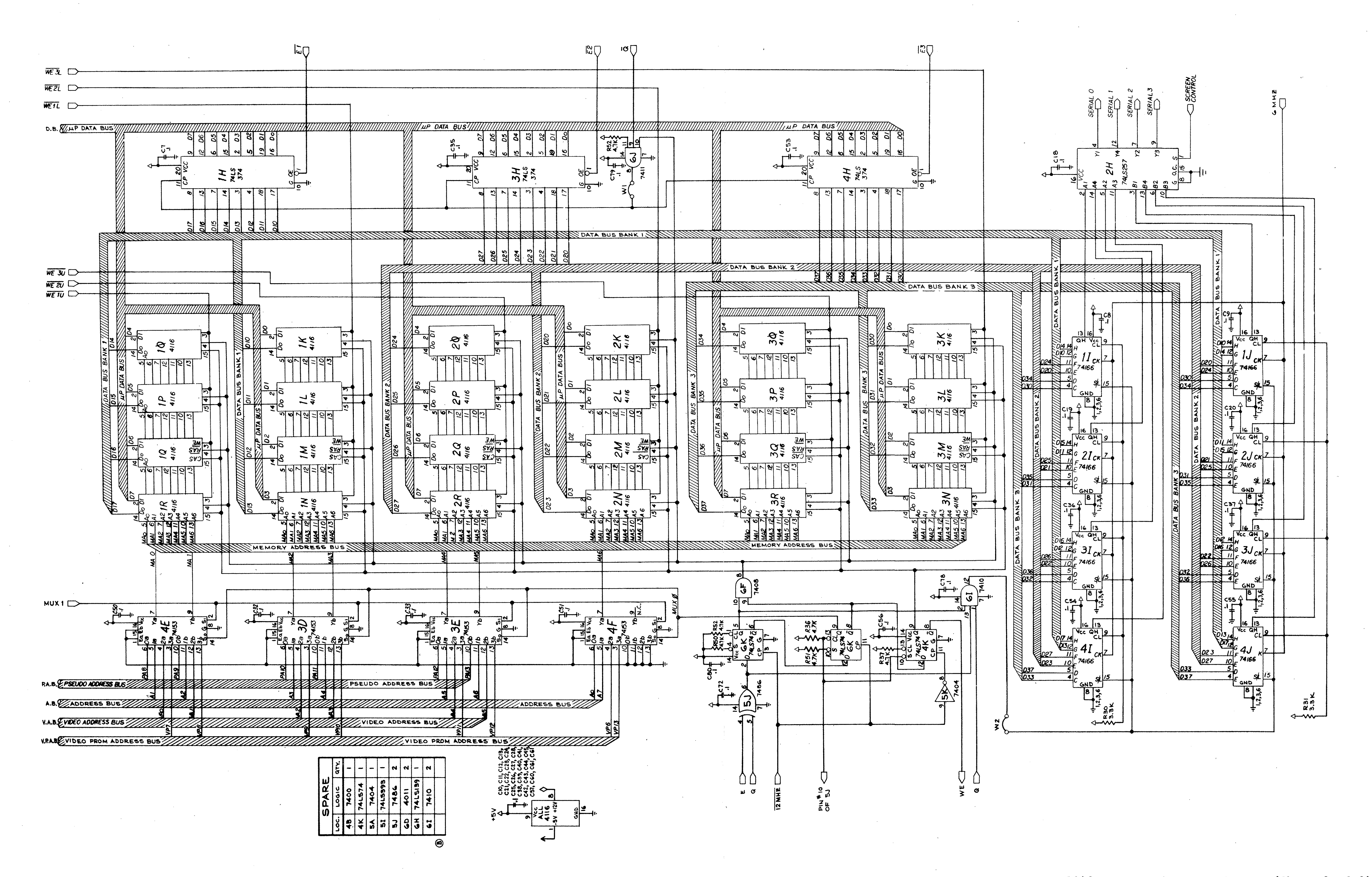
1. 4116: 1K, 1L, 1M, 1N, 1O, 1P, 1Q, 1R, 2K, 2L, 2M, 2N, 2O, 2P, 2Q, 2R, 3K, 3L, 3M, 3N, 3O, 3P, 3Q, 3R
2. 4.7 K Ω RESISTOR: R26, R27, R28, R29, R32, R33, R35, R36, R37, R38, R39, R41, R43, R45, R50, R51, R52, R66 R67 R68, R69, R70, R71, R75, R34, R76 R77
3. .1 MFD. CAPACITORS: C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C85, C86, C87, C90, C91, C92
4. FOR SCHEMATIC REFER TO 16-8809

B9072 BILL OF MATERIAL

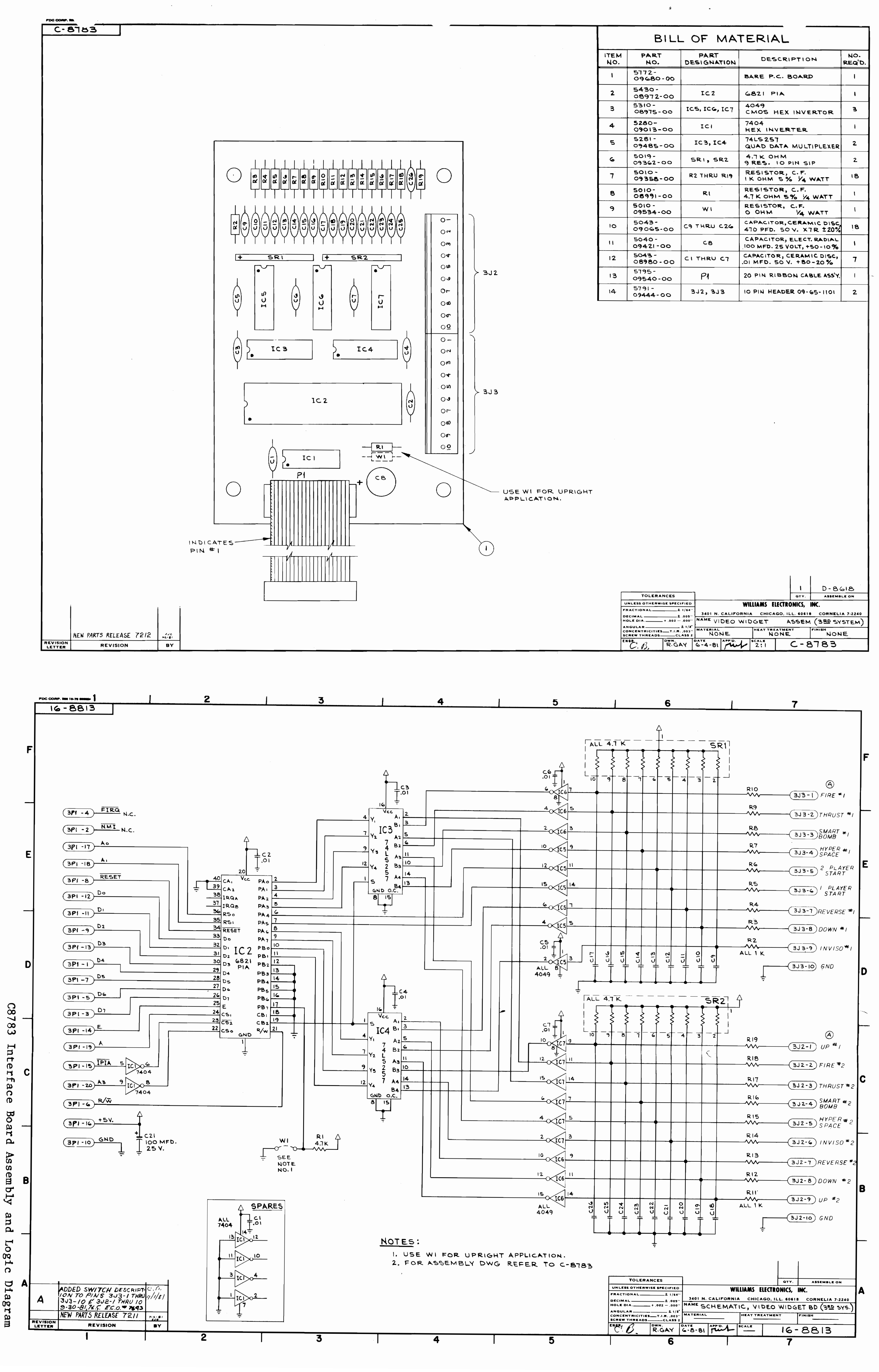
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
1	5770-09810-00		BARE P.C. BOARD	1
2	5280-09011-00	IC1	7410 TRIPLE 3-INPUT NAND	1
3	5160-08938-00	Q1	2N4401, TO-92 TRANSISTOR, NPN	1
4	5010-09358-00	R1	RESISTOR, C.F. 1 K Ω 5% ¼ WATT	1
5	5010-08991-00	R2	RESISTOR, C.F. 4.7 K Ω 5% ¼ WATT	1
6	5010-09034-00	R3	RESISTOR, C.F. 10 K Ω 5% ¼ WATT	1
7	5701-09812-00		14 PIN I.C. HEADER	1



R8948 CPU Board Logic Diagram (Sheet 1 of 2)



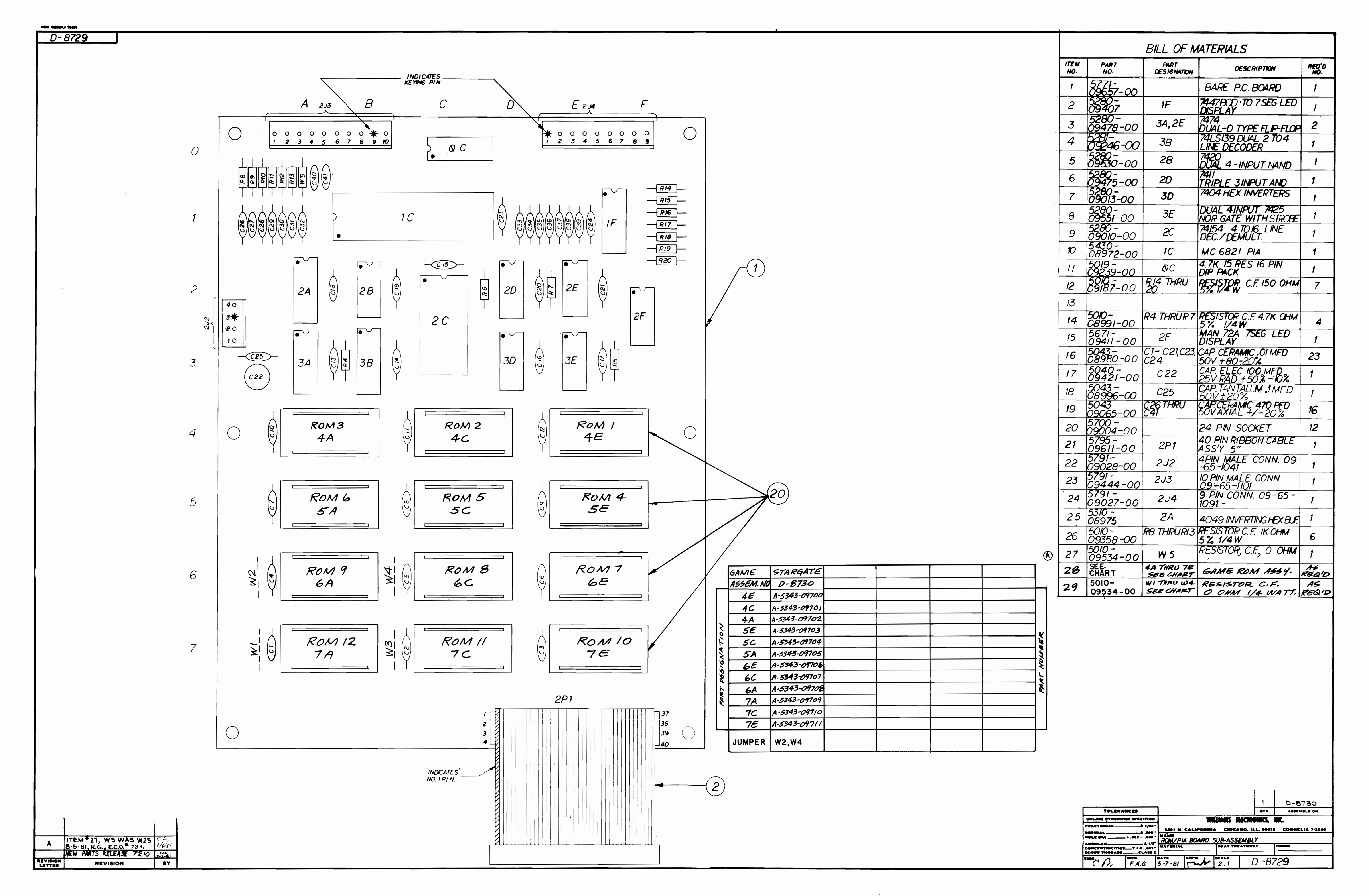
R8948 CPU Board Logic Diagram (Sheet 2 of 2)



BILL OF MATERIAL

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	NO. REQ'D.
1	5772-09680-00		BARE P.C. BOARD	1
2	5430-08972-00	IC2	6821 PIA	1
3	5310-08975-00	IC5, IC6, IC7	4049 CMOS HEX INVERTOR	3
4	5280-09013-00	IC1	7404 HEX INVERTER	1
5	5281-09485-00	IC3, IC4	74LS257 QUAD DATA MULTIPLEXER	2
6	5019-09362-00	SR1, SR2	4.7K OHM 9 RES. 10 PIN SIP	2
7	5010-09358-00	R2 THRU R19	RESISTOR, C.F. 1K OHM 5% 1/4 WATT	18
8	5010-08991-00	R1	RESISTOR, C.F. 4.7K OHM 5% 1/4 WATT	1
9	5010-09534-00	W1	RESISTOR, C.F. 0 OHM 1/4 WATT	1
10	5043-09065-00	C9 THRU C26	CAPACITOR, CERAMIC DISC, 470 PFD. 50 V. X7R ±20%	18
11	5040-09421-00	C8	CAPACITOR, ELECT. RADIAL 100 MFD. 25 VOLT, +50-10%	1
12	5043-08980-00	C1 THRU C7	CAPACITOR, CERAMIC DISC, .01 MFD. 50 V. +80-20%	7
13	5795-09540-00	P1	20 PIN RIBBON CABLE ASS'Y.	1
14	5791-09444-00	3J2, 3J3	10 PIN HEADER 09-65-1101	2

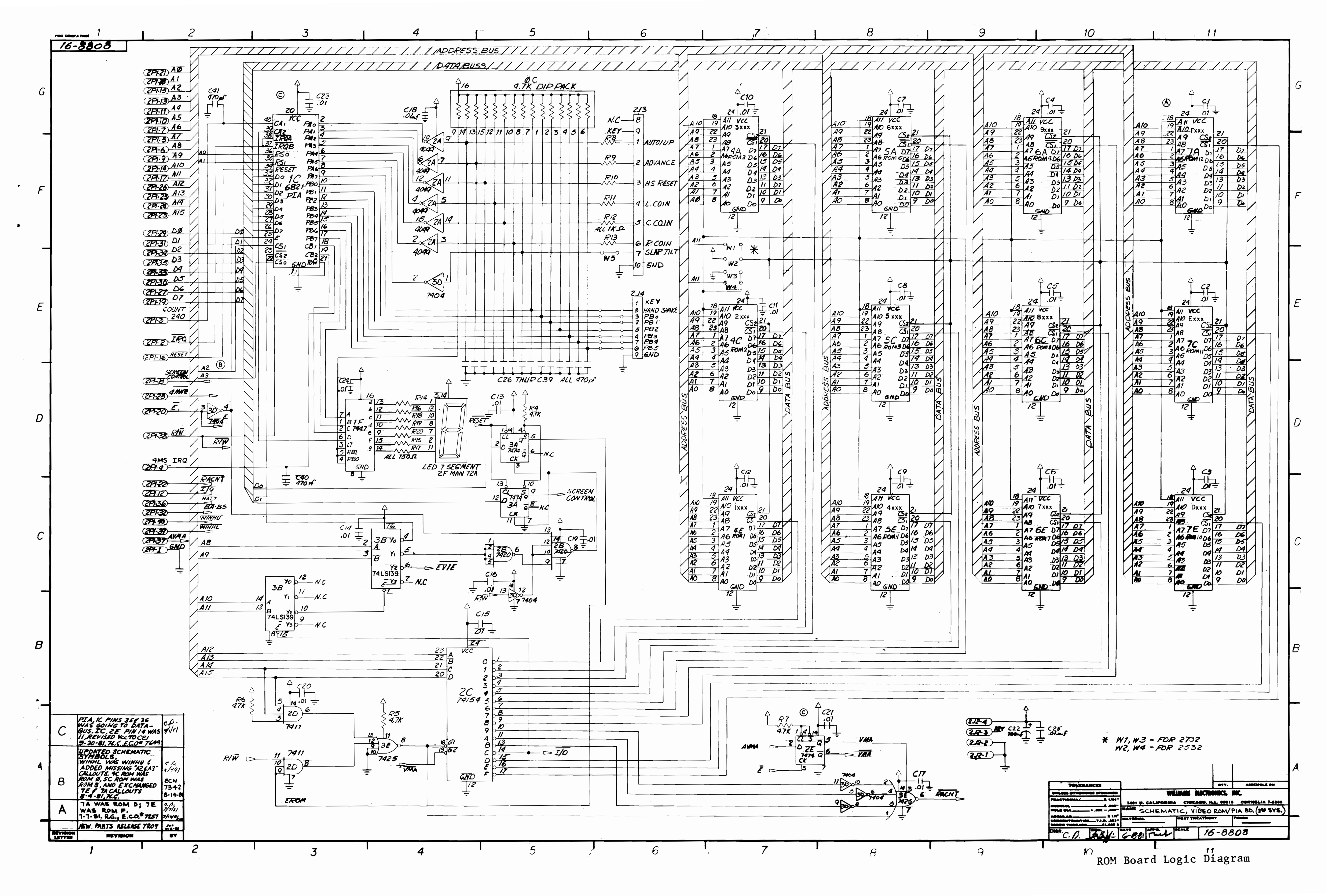
C8783 Interface Board Assembly and Logic Diagram



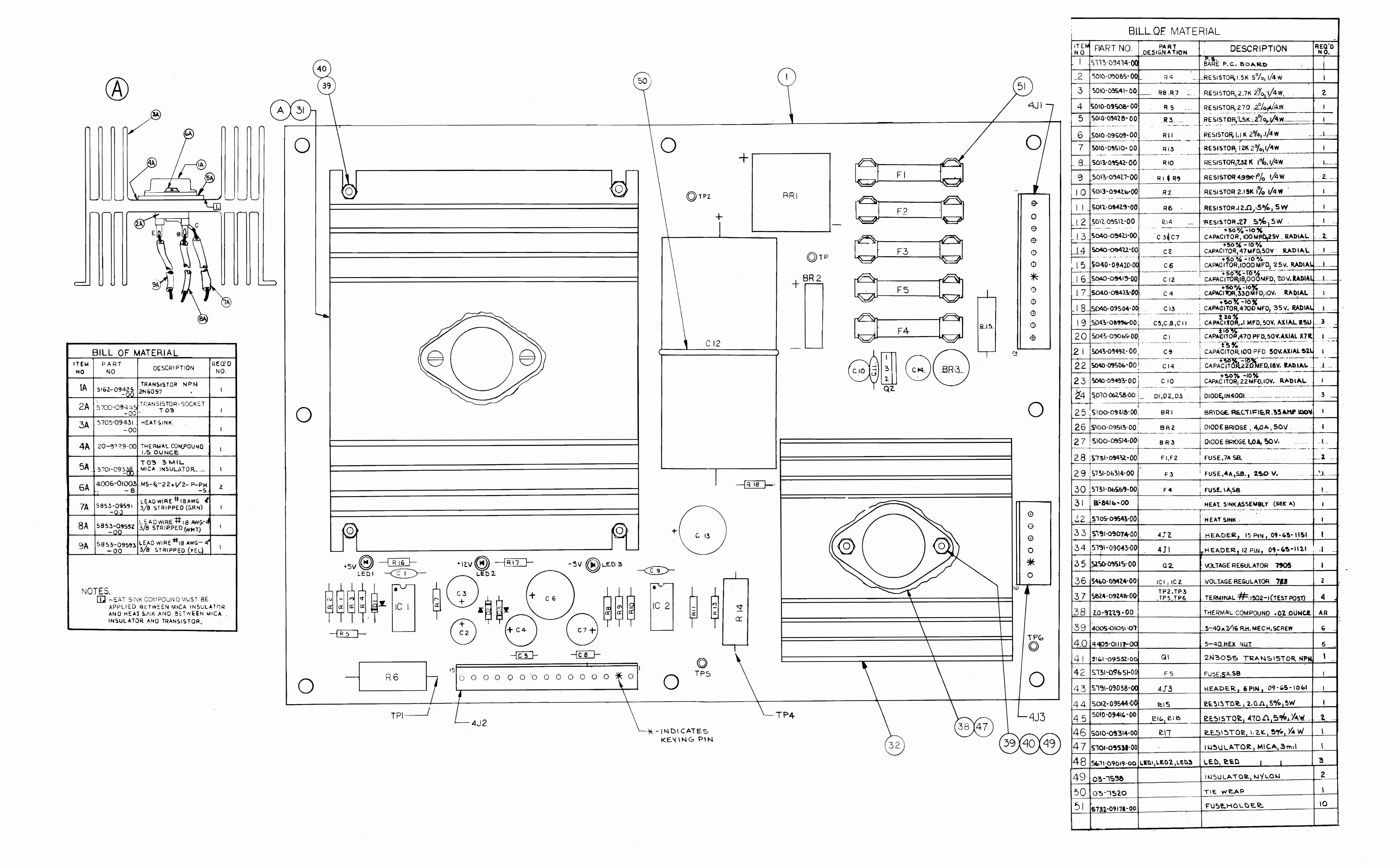
BILL OF MATERIALS

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	5771-09657-00		BARE P.C. BOARD	1
2	5280-09407	1F	7447BCD TO 7 SEG LED DISPLAY	1
3	5280-09478-00	3A, 2E	7474 DUAL-D TYPE FLIP-FLOP	2
4	5281-09246-00	3B	74LS139 DUAL 2 TO 4 LINE DECODER	1
5	5280-09530-00	2B	7420 DUAL 4-INPUT NAND	1
6	5280-09475-00	2D	7411 TRIPLE 3 INPUT AND	1
7	5280-09013-00	3D	7404 HEX INVERTERS	1
8	5280-09551-00	3E	DUAL 4 INPUT 7425 NOR GATE WITH STROBE	1
9	5280-09010-00	2C	74154 4 TO 16 LINE DEC./DEMULT.	1
10	5430-08972-00	1C	MC 6821 PIA	1
11	5019-09239-00	0C	4.7K 15 RES 16 PIN DIP PACK	1
12	5010-09187-00	R14 THRU 20	RESISTOR C.F. 150 OHM 5% 1/4 W	7
13				
14	5010-08991-00	R4 THRU R7	RESISTOR C.F. 4.7K OHM 5% 1/4 W	4
15	5671-09411-00	2F	MAN 72A 7SEG LED DISPLAY	1
16	5043-08980-00	C1-C21, C23, C24	CAP CERAMIC .01 MFD 50V +80-20%	23
17	5040-09421-00	C22	CAP. ELEC 100 MFD 25V RAD +50%-10%	1
18	5043-08996-00	C25	CAP. TANTALUM .1 MFD 50V ±20%	1
19	5043-09065-00	C26 THRU C41	CAP CERAMIC 470 PFD 50V AXIAL +/-20%	16
20	5700-09004-00		24 PIN SOCKET	12
21	5795-09611-00	2P1	40 PIN RIBBON CABLE ASS'Y. 5"	1
22	5791-09028-00	2J2	4 PIN MALE CONN. 09-65-1041	1
23	5791-09444-00	2J3	10 PIN MALE CONN. 09-65-1101	1
24	5791-09027-00	2J4	9 PIN CONN. 09-65-1091-	1
25	5310-08975	2A	4049 INVERTING HEX BUF.	1
26	5010-09358-00	R8 THRU R13	RESISTOR C.F. 1K OHM 5% 1/4 W	6
Ⓐ 27	5010-09534-00	W5	RESISTOR, C.F., 0 OHM	1
28	SEE CHART	4A THRU 7E SEE CHART	GAME ROM ASSY.	AS REQ'D
29	5010-09534-00	W1 THRU W4 SEE CHART	RESISTOR C.F. 0 OHM 1/4 WATT.	AS REQ'D

GAME	STARGATE				
ASSEM. NO.	D-8730				
4E	A-5343-09700				
4C	A-5343-09701				
4A	A-5343-09702				
5E	A-5343-09703				
5C	A-5343-09704				
5A	A-5343-09705				
6E	A-5343-09706				
6C	A-5343-09707				
6A	A-5343-09708				
7A	A-5343-09709				
7C	A-5343-09710				
7E	A-5343-09711				
JUMPER	W2, W4				



ROM Board Logic Diagram



BILL OF MATERIAL

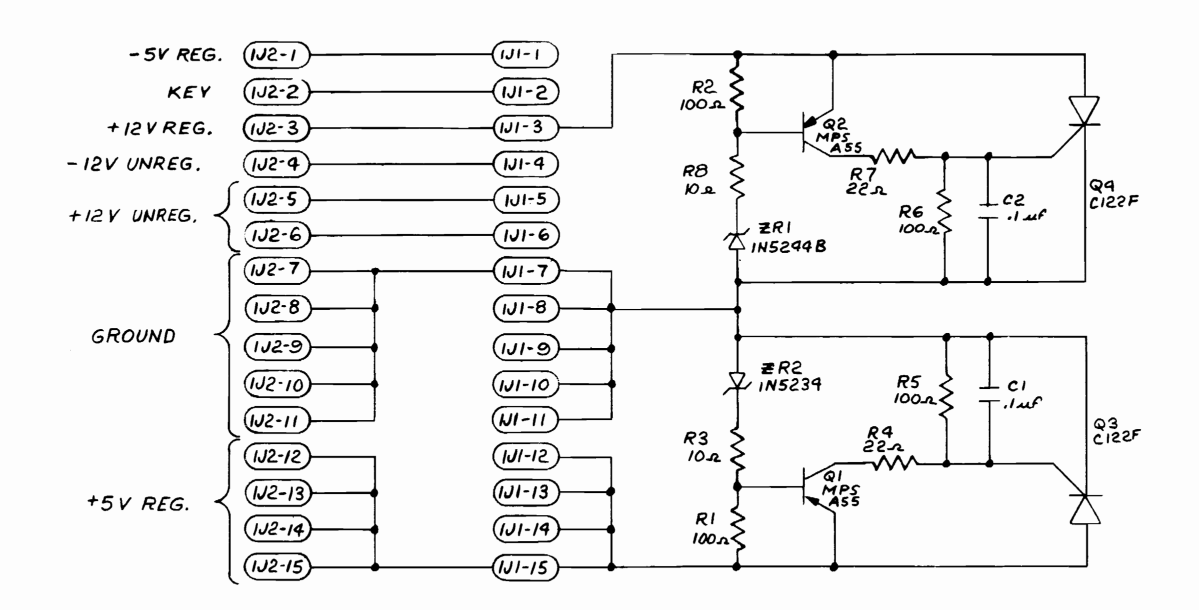
ITEM NO	PART NO	DESCRIPTION	REQ'D NO.
1A	5162-09425-00	TRANSISTOR NPN 2N6057	1
2A	5700-09445-00	TRANSISTOR-SOCKET T03	1
3A	5705-09431-00	HEAT SINK	1
4A	20-9229-00	THERMAL COMPOUND 1.5 OUNCE	1
5A	5701-09538-00	T03 3 MIL MICA INSULATOR	1
6A	4006-01003-8	MS-6-22x1/2-P-PH-S	2
7A	5853-09591-00	LEAD WIRE #18 AWG 4" 3/8 STRIPPED (GRN)	1
8A	5853-09592-00	LEAD WIRE #18 AWG-4" 3/8 STRIPPED (WHT)	1
9A	5853-09593-00	LEAD WIRE #18 AWG-4" 3/8 STRIPPED (YEL)	1

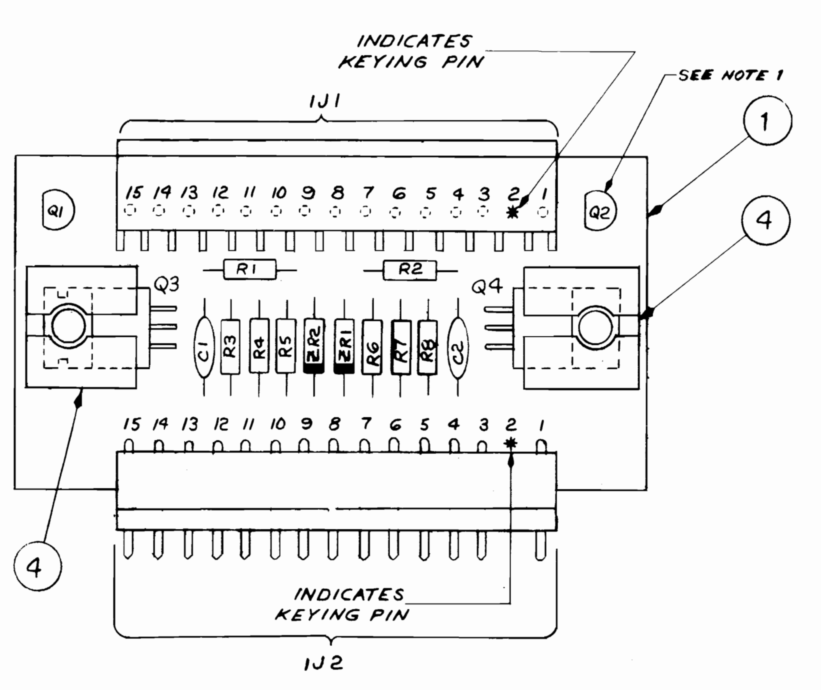
NOTES.
1. HEAT SINK COMPOUND MUST BE APPLIED BETWEEN MICA INSULATOR AND HEAT SINK AND BETWEEN MICA INSULATOR AND TRANSISTOR.

BILL OF MATERIAL

ITEM NO	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	5773-09414-00		P.S. BARE P.C. BOARD	1
2	5010-09085-00	R4	RESISTOR, 1.5K 5%, 1/4 W	1
3	5010-09541-00	R8, R7	RESISTOR, 2.7K 2%, 1/4W,	2
4	5010-09508-00	R5	RESISTOR, 270 2%, 1/4W	1
5	5010-09428-00	R3	RESISTOR, 1.5K 2%, 1/4W	1
6	5010-09509-00	R11	RESISTOR, 1.1K 2%, 1/4 W	1
7	5010-09510-00	R13	RESISTOR, 12K 2%, 1/4W	1
8	5013-09542-00	R10	RESISTOR, 7.32 K 1%, 1/4W	1
9	5013-09427-00	R1 & R9	RESISTOR 4.99K 1% 1/4W	2
10	5013-09426-00	R2	RESISTOR 2.15K 1% 1/4 W	1
11	5012-08429-00	R6	RESISTOR .12Ω, 5%, 5W	1
12	5012-09512-00	R14	RESISTOR .27 5%, 5W	1
13	5040-09421-00	C3 & C7	+50% -10% CAPACITOR, 100 MFD, 25V. RADIAL	2
14	5040-09422-00	C2	+50% -10% CAPACITOR, 47 MFD, 50V RADIAL	1
15	5040-09420-00	C6	+50% -10% CAPACITOR, 1000 MFD, 25V. RADIAL	1
16	5040-09419-00	C12	+50% -10% CAPACITOR, 18,000 MFD, 20V. RADIAL	1
17	5040-09423-00	C4	+50% -10% CAPACITOR, 330 MFD, 10V. RADIAL	1
18	5040-09504-00	C13	+50% -10% CAPACITOR, 4700 MFD, 35V. RADIAL	1
19	5043-08996-00	C5, C8, C11	±20% CAPACITOR, .1 MFD, 50V. AXIAL Z5U	3
20	5043-09065-00	C1	±10% CAPACITOR, 470 PFD, 50V. AXIAL X7R	1
21	5043-09492-00	C9	±5% CAPACITOR, 100 PFD 50V. AXIAL S2L	1
22	5040-09506-00	C14	+50% -10% CAPACITOR, 220 MFD, 16V. RADIAL	1
23	5040-09493-00	C10	+50% -10% CAPACITOR, 22 MFD, 10V. RADIAL	1
24	5070-06258-00	D1, D2, D3	DIODE, IN4001	3
25	5100-09418-00	BR1	BRIDGE RECTIFIER 35 AMP 100V	1
26	5100-09513-00	BR2	DIODE BRIDGE, 4.0A, 50V	1
27	5100-09514-00	BR3	DIODE BRIDGE 1.0A, 50V.	1
28	5731-09432-00	F1, F2	FUSE, 7A SB.	2
29	5731-06314-00	F3	FUSE, 4A, SB., 250 V.	1
30	5731-06569-00	F4	FUSE, 1A, SB	1
31	B-8416-00		HEAT SINK ASSEMBLY (SEE A)	1
32	5705-09543-00		HEAT SINK	1
33	5791-09074-00	4J2	HEADER, 15 PIN, 09-65-1151	1
34	5791-09043-00	4J1	HEADER, 12 PIN, 09-65-1121	1
35	5250-09515-00	Q2	VOLTAGE REGULATOR 7905	1
36	5460-09424-00	IC1, IC2	VOLTAGE REGULATOR 723	2
37	5824-09248-00	TP2, TP3, TP5, TP6	TERMINAL #1502-1 (TEST POST)	4
38	20-9229-00		THERMAL COMPOUND .02 OUNCE	AR
39	4005-01051-07		5-40x7/16 R.H. MECH. SCREW	6
40	4405-01117-00		5-40 HEX NUT	6
41	5161-09552-00	Q1	2N3055 TRANSISTOR NPN	1
42	5731-09651-00	F5	FUSE, 5A, SB	1
43	5791-09038-00	4J3	HEADER, 6 PIN, 09-65-1061	1
44	5012-09544-00	R15	RESISTOR, 2.0Ω, 5%, 5W	1
45	5010-09416-00	R16, R18	RESISTOR, 470Ω, 5%, 1/4W	2
46	5010-09314-00	R17	RESISTOR, 1.2K, 5%, 1/4 W	1
47	5701-09538-00		INSULATOR, MICA, 3mil	1
48	5671-09019-00	LED1, LED2, LED3	LED, RED	3
49	03-7598		INSULATOR, NYLON	2
50	03-7520		TIE WRAP	1
51	5732-09178-00		FUSEHOLDER	10

Power Supply Board Assembly Drawing





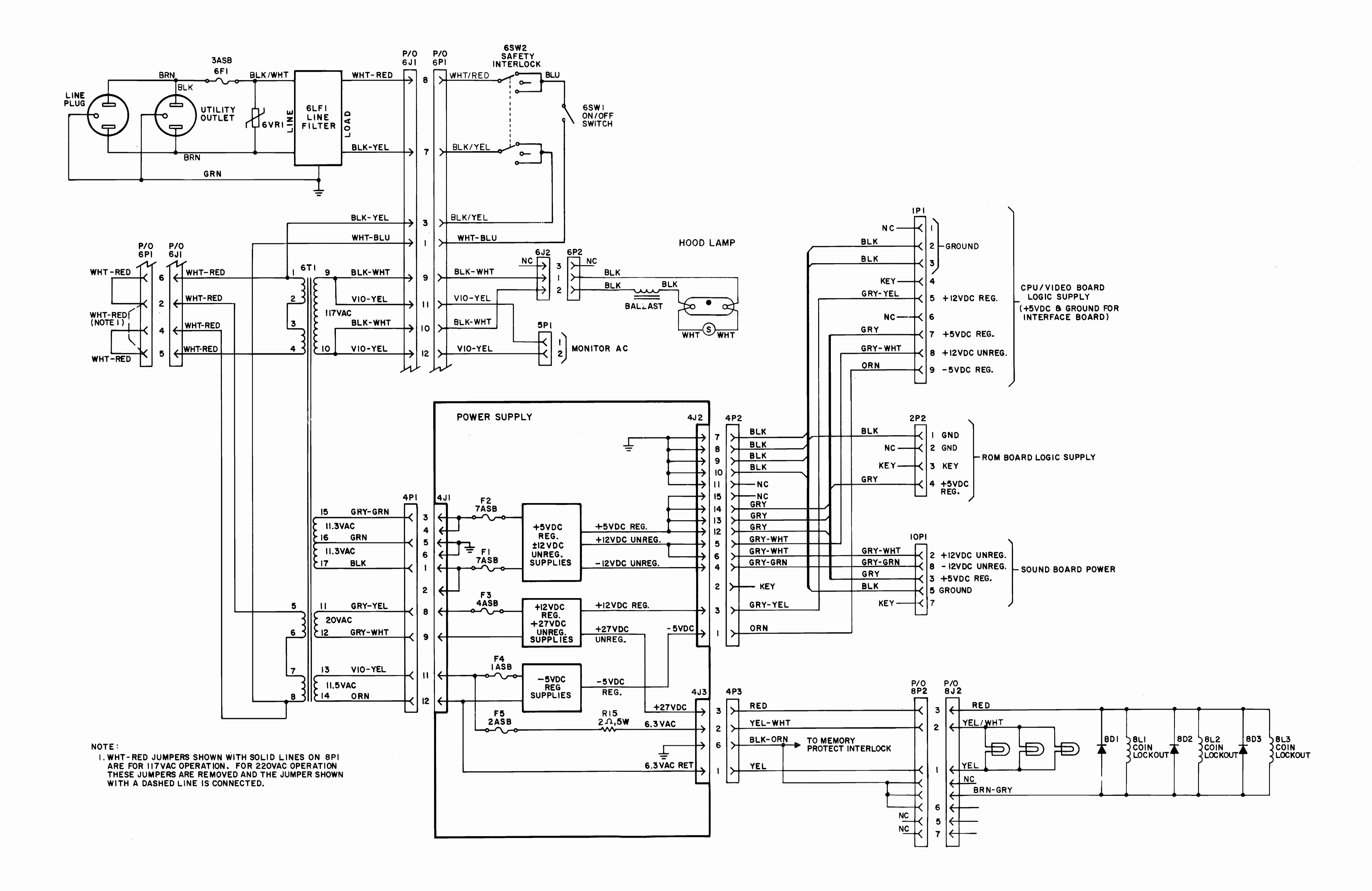
NOTES:
1. OBSERVE POLARITY OF CAPACITORS, DIODES AND POSITION OF TRANSISTORS.
2. REFERENCE DWG: SCHEMATIC 16-8810

BILL OF MATERIALS

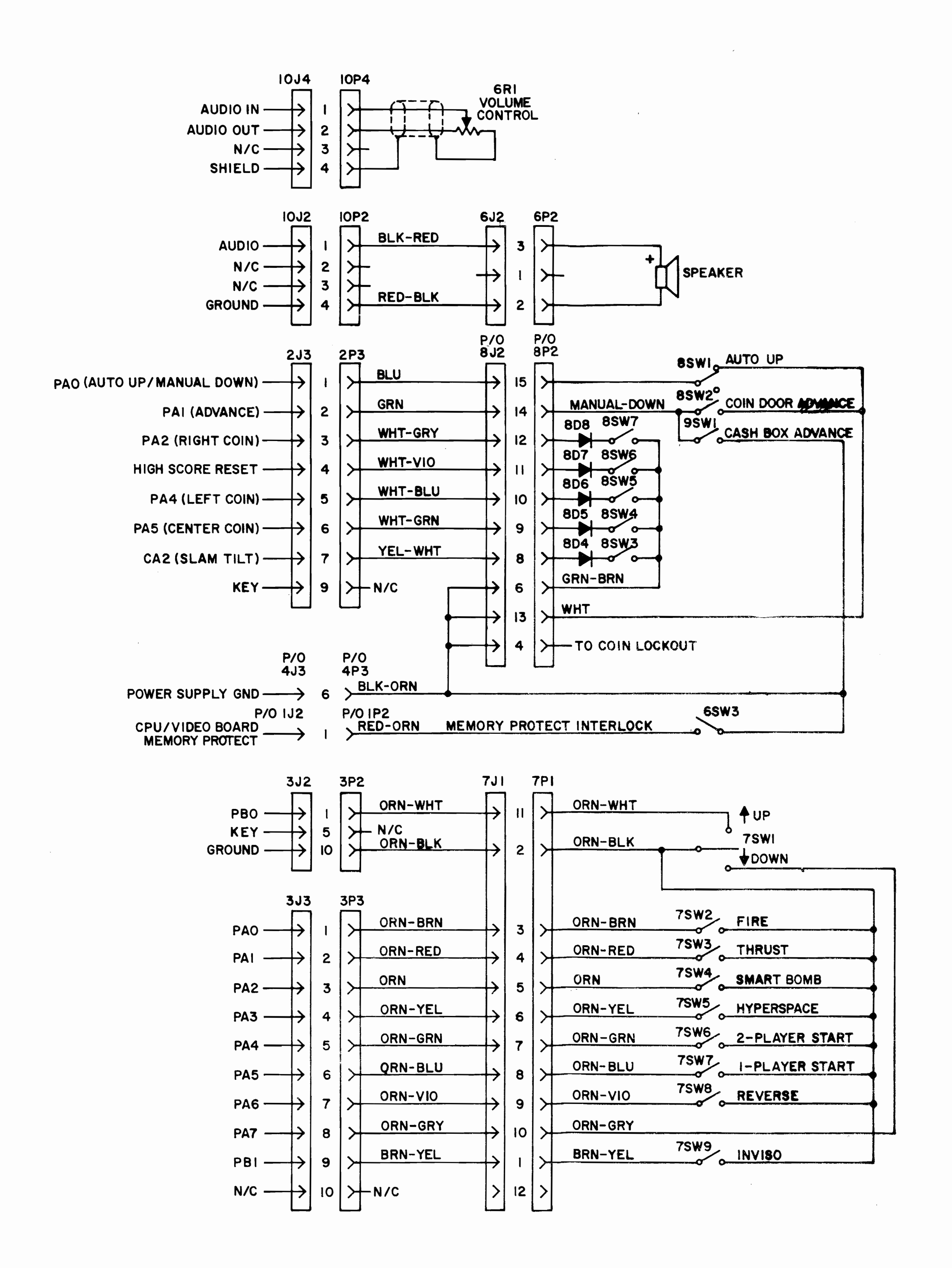
ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D NO.
1	5773-09664-00		BARE P.C. BOARD	1
2	5792-09676-00	1J1	RIGHT ANGLE CONNECTOR, 15 PIN	1
3	5791-09670-00	1J2	HEADER CONNECTOR, 15 PIN	1
4	5705-09663-00		HEAT SINK, AAVID 5741	2
	5705-09688-00		HEAT SINK, THERMALLOY 6043	0
7	5130-09661-00	Q3, Q4	SCR 122F (100V)	2
8	5190-09430-00	Q1, Q2	TRANSISTOR MPS A55	2
9	5075-09662-00	ZR1	ZENER 1N5244 ± 5% (14V)	1
10	5075-09406-00	ZR2	ZENER 1N5239 ± 5% (6.2V)	1
11	5010-09036-00	R1, R2, R5 & R6	RESISTOR C.F. 100 Ω ± 5% 1/4W	4
12	5010-09039-00	R3, R8	RESISTOR C.F. 10 Ω ± 5% 1/4W	2
13	5010-09434-00	R4, R7	RESISTOR C.F. 22 Ω ± 5% 1/4W	2
14	5043-08996-00	C1, C2	CAPACITOR 0.1 μf CERAMIC +80% -20% 50V	2

NOTE:
W1 CONNECTED ONLY FOR COCKTAIL APPLICATIONS.

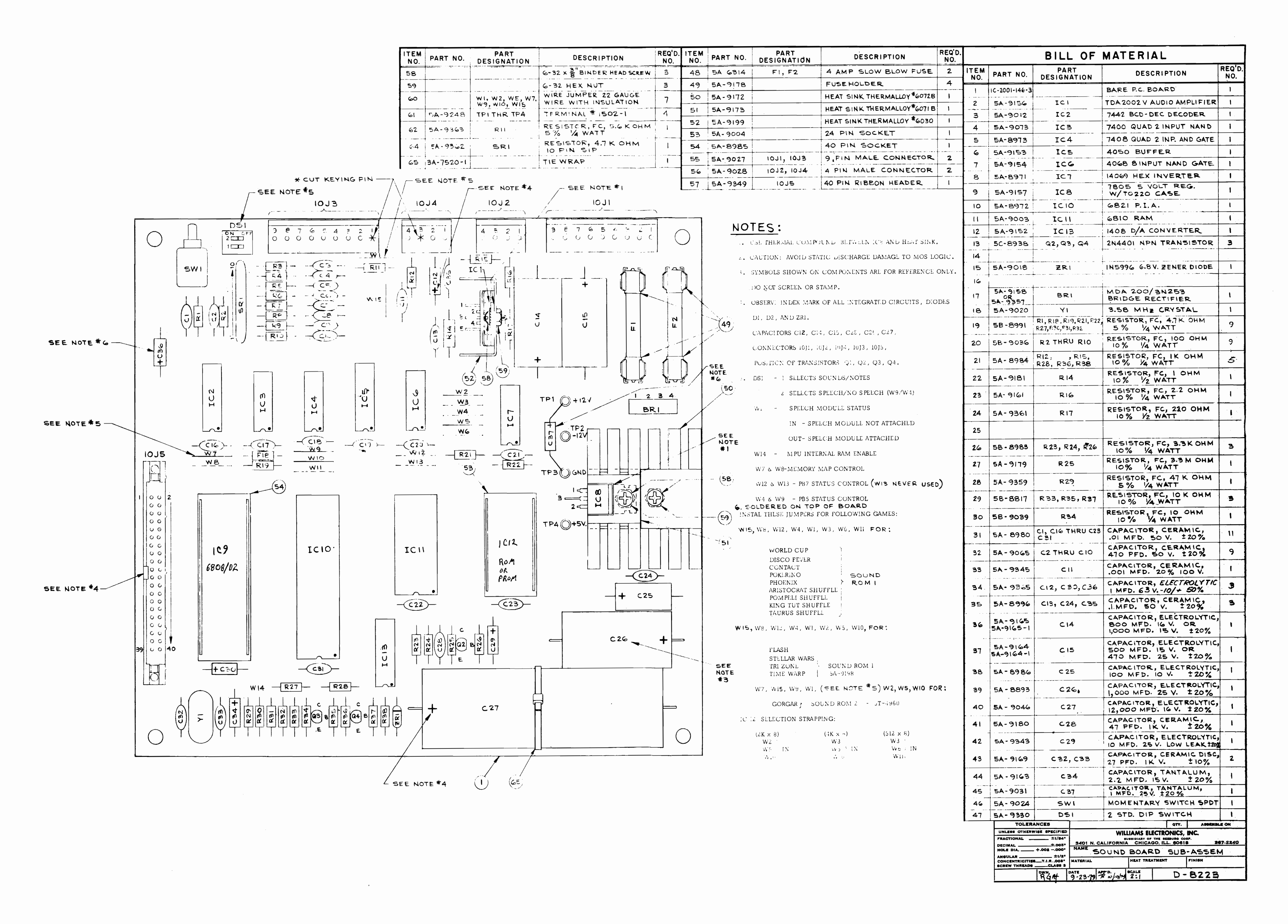
Power Supply Board Schematic Diagram and Overvoltage Protection Board



Power Wiring Diagram



Cabinet Wiring Diagram



ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
58			6-32 x 3/8" BINDER HEAD SCREW	3
59			6-32 HEX NUT	3
60		W1, W2, W5, W7, W9, W10, W15	WIRE JUMPER 22 GAUGE WIRE WITH INSULATION	7
61	5A-9248	TP1 THR TP4	TERMINAL # 1502-1	4
62	5A-9363	R11	RESISTOR, FC, 5.6 K OHM 5% 1/4 WATT	1
64	5A-9362	SR1	RESISTOR, 4.7 K OHM 10 PIN SIP	1
65	3A-7520-1		TIE WRAP	1

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
48	5A 6314	F1, F2	4 AMP SLOW BLOW FUSE	2
49	5A-9178		FUSEHOLDER	4
50	5A-9172		HEAT SINK THERMALLOY #6072B	1
51	5A-9173		HEAT SINK THERMALLOY #6071B	1
52	5A-9199		HEAT SINK THERMALLOY #6030	1
53	5A-9004		24 PIN SOCKET	1
54	5A-8985		40 PIN SOCKET	1
55	5A-9027	10J1, 10J3	9 PIN MALE CONNECTOR	2
56	5A-9028	10J2, 10J4	4 PIN MALE CONNECTOR	2
57	5A-9349	10J5	40 PIN RIBBON HEADER	1

BILL OF MATERIAL

ITEM NO.	PART NO.	PART DESIGNATION	DESCRIPTION	REQ'D. NO.
1	1C-2001-146-3		BARE P.C. BOARD	1
2	5A-9156	IC1	TDA2002 V AUDIO AMPLIFIER	1
3	5A-9012	IC2	7442 BCD-DEC DECODER	1
4	5A-9073	IC3	7400 QUAD 2 INPUT NAND	1
5	5A-8973	IC4	7408 QUAD 2 INP. AND GATE	1
6	5A-9153	IC5	4050 BUFFER	1
7	5A-9154	IC6	4068 8 INPUT NAND GATE	1
8	5A-8971	IC7	14069 HEX INVERTER	1
9	5A-9157	IC8	7805 5 VOLT REG. W/TO220 CASE	1
10	5A-8972	IC10	6821 P.I.A.	1
11	5A-9003	IC11	6810 RAM	1
12	5A-9152	IC13	1408 D/A CONVERTER	1
13	5C-8938	Q2, Q3, Q4	2N4401 NPN TRANSISTOR	3
14				
15	5A-9018	ZR1	1N5996 6.8V. ZENER DIODE	1
16				
17	5A-9158 OR 5A-9357	BR1	MDA 200/3N253 BRIDGE RECTIFIER	1
18	5A-9020	Y1	3.58 MHz CRYSTAL	1
19	5B-8991	R1, R18, R19, R21, R22, R27, R30, R31, R32	RESISTOR, FC, 4.7K OHM 5% 1/4 WATT	9
20	5B-9036	R2 THRU R10	RESISTOR, FC, 100 OHM 10% 1/4 WATT	9
21	5A-8984	R12, , R15, R28, R36, R38	RESISTOR, FC, 1K OHM 10% 1/4 WATT	5
22	5A-9181	R14	RESISTOR, FC, 1 OHM 10% 1/2 WATT	1
23	5A-9161	R16	RESISTOR, FC, 2.2 OHM 10% 1/4 WATT	1
24	5A-9361	R17	RESISTOR, FC, 220 OHM 10% 1/2 WATT	1
25				
26	5B-8983	R23, R24, R26	RESISTOR, FC, 3.3K OHM 10% 1/4 WATT	3
27	5A-9179	R25	RESISTOR, FC, 3.3M OHM 10% 1/4 WATT	1
28	5A-9359	R29	RESISTOR, FC, 47 K OHM 5% 1/4 WATT	1
29	5B-8817	R33, R35, R37	RESISTOR, FC, 10 K OHM 10% 1/4 WATT	3
30	5B-9039	R34	RESISTOR, FC, 10 OHM 10% 1/4 WATT	1
31	5A-8980	C1, C16 THRU C23 C31	CAPACITOR, CERAMIC, .01 MFD. 50 V. ±20%	11
32	5A-9065	C2 THRU C10	CAPACITOR, CERAMIC, 470 PFD. 50 V. ±20%	9
33	5A-9345	C11	CAPACITOR, CERAMIC, .001 MFD. 20% 100 V.	1
34	5A-9365	C12, C30, C36	CAPACITOR, ELECTROLYTIC 1 MFD. 63 V. -10/+50%	3
35	5A-8996	C13, C24, C35	CAPACITOR, CERAMIC, .1 MFD. 50 V. ±20%	3
36	5A-9165 5A-9165-1	C14	CAPACITOR, ELECTROLYTIC, 800 MFD. 16 V. OR 1,000 MFD. 15 V. ±20%	1
37	5A-9164 5A-9164-1	C15	CAPACITOR, ELECTROLYTIC, 500 MFD. 15 V. OR 470 MFD. 25 V. ±20%	1
38	5A-8986	C25	CAPACITOR, ELECTROLYTIC, 100 MFD. 10 V. ±20%	1
39	5A-8893	C26	CAPACITOR, ELECTROLYTIC, 1,000 MFD. 25 V. ±20%	1
40	5A-9046	C27	CAPACITOR, ELECTROLYTIC, 12,000 MFD. 16 V. ±20%	1
41	5A-9180	C28	CAPACITOR, CERAMIC, 47 PFD. 1K V. ±20%	1
42	5A-9343	C29	CAPACITOR, ELECTROLYTIC, 10 MFD. 25 V. LOW LEAK ±20%	1
43	5A-9169	C32, C33	CAPACITOR, CERAMIC DISC, 27 PFD. 1K V. ±10%	2
44	5A-9163	C34	CAPACITOR, TANTALUM, 2.2 MFD. 15 V. ±20%	1
45	5A-9031	C37	CAPACITOR, TANTALUM, 1 MFD. 25 V. ±20%	1
46	5A-9024	SW1	MOMENTARY SWITCH SPDT	1
47	5A-9330	DS1	2 STD. DIP SWITCH	1

TOLERANCES UNLESS OTHERWISE SPECIFIED			
FRACTIONAL ±1/64" DECIMAL ±.005" HOLE DIA. +.002 -.000" ANGULAR ±1/2" CONCENTRICITIES T.I.R. .003" SCREW THREADS CLASS 3	WILLIAMS ELECTRONICS, INC. SUBSIDIARY OF THE SEEBURG CORP. 3401 N. CALIFORNIA CHICAGO, ILL. 60618 267-2240	QTY.	ASSEMBLE ON
	NAME SOUND BOARD SUB-ASSEM		
	MATERIAL	HEAT TREATMENT	FINISH
DWN. RGM	DATE 9-23-79	APP'D. [illegible] 10/19/79	SCALE 2:1 D-8223

NOTES:

1. USE THERMAL COMPOUND BETWEEN IC8 AND HEAT SINK.
2. CAUTION: AVOID STATIC DISCHARGE DAMAGE TO MOS LOGIC.
3. SYMBOLS SHOWN ON COMPONENTS ARE FOR REFERENCE ONLY. DO NOT SCREEN OR STAMP.
4. OBSERVE INDEX MARK OF ALL INTEGRATED CIRCUITS, DIODES D1, D2, AND ZR1. CAPACITORS C12, C14, C15, C25, C26, C27, CONNECTORS 10J1, 10J2, 10J4, 10J3, 10J5, POSITION OF TRANSISTORS Q1, Q2, Q3, Q4.
5. DS1 - 1 SELECTS SOUNDS/NOTES
   2 SELECTS SPEECH/NO SPEECH (W9/W4)
   W1 - SPEECH MODULE STATUS
   IN - SPEECH MODULE NOT ATTACHED
   OUT - SPEECH MODULE ATTACHED
   W14 - MPU INTERNAL RAM ENABLE
   W7 & W8 - MEMORY MAP CONTROL
   W12 & W13 - PB7 STATUS CONTROL (W13 NEVER USED)
   W4 & W9 - PB5 STATUS CONTROL
6. SOLDERED ON TOP OF BOARD
   INSTAL THESE JUMPERS FOR FOLLOWING GAMES:

W15, W8, W12, W4, W1, W3, W6, W11 FOR:

WORLD CUP
DISCO FEVER
CONTACT
POKERINO
PHOENIX
ARISTOCRAT SHUFFLE
POMPEII SHUFFLE
KING TUT SHUFFLE
TAURUS SHUFFLE
} SOUND ROM 1

W15, W8, W12, W4, W1, W2, W5, W10, FOR:

FLASH
STELLAR WARS
TRI ZONE
TIME WARP
} SOUND ROM 1 5A-9198

W7, W15, W9, W1, (SEE NOTE #5) W2, W5, W10 FOR:

GORGAR; SOUND ROM 2 - 5T-4960

IC 12 SELECTION STRAPPING:

(2K x 8)	(4K x 8)	(512 x 8)
W2	W3	W3
W5 IN	W5 IN	W6 IN
W[illegible]	W[illegible]	W11

D8224 Sound Board Assembly Drawing

